



92mW Direct Conversion I/Q Modulator Has Better than 50dB Sideband & Carrier Suppression

MILPITAS, CA – August 11, 2014 – A new low power I/Q modulator from Linear Technology enables battery-powered transmitters operating in the 30MHz to 1.3GHz frequency bands, breaking new ground in power consumption, sideband suppression, carrier leakage and dynamic range performance. The [LTC5599](#) modulator, powered from a single 2.7V to 3.6V supply, draws only 28mA current, less than 60% that of alternative solutions—with no performance sacrifice. The LTC5599 delivers outstanding native –52.6dBc sideband suppression and –51.5dBm carrier leakage without calibration. With on-chip calibration resources, performance can be further improved to –60dBc and –65dBm, respectively. Moreover the device output achieves an excellent noise floor of –156dBm/Hz with an OIP3 of 20.8dBm, delivering superior transmitter performance.

The LTC5599 combines low power consumption and robust performance to suit a wide range of demanding battery-powered radios and wireless communications applications that are exposed to strong radio interference. These include wireless professional microphones, frequency hopping narrowband and broadband portable field radios, public safety radios, train communications, as well as broadband VHF/UHF white space modems, software-defined radios, portable RF test equipment, picocell base stations, low-power microwave backhaul, small wireless repeaters and satellite modems.

The device's gain can be set via the on-chip serial port. A coarse gain control provides 1dB/step, along with adjustable fine gain control of 0.1dB. Total gain ranges from –19dB to 0dB.

Varying the modulator gain enables device supply current from 8mA to 35mA, allowing the device to be set to lower power consumption with slightly reduced gain and performance, as needed for specific applications. Once set, the gain can be automatically temperature compensated by activating the on-chip temperature correction feature.

The LTC5599 supports narrowband and wideband radio applications. Its I and Q inputs are each capable of –1dB modulation bandwidth of up to 37MHz, supporting a total of 74MHz RF bandwidth at 900MHz frequency.

The LTC5599 is available in a 4mm x 4mm QFN package, providing a compact footprint. The product is specified for case operating temperature from –40°C to 105°C, supporting reliable operation in extended temperature environments. The device can be conveniently shut down with an enable control pin. When disabled, the device conserves power by drawing a typical of 0.7µA standby current. The LTC5599, priced starting at \$4.45 each in 1,000-pieces quantities, is available immediately in production quantities. For more information, visit www.linear.com/product/LTC5599

Photo Caption: Low Power Direct Conversion I/Q Modulator


Summary of Features: LTC5599

- Operating Frequency 30MHz to 1.3GHz
- Power Consumption 3.3V / 28mA
- Sideband Suppression –52.6dBc at 500MHz
- Carrier Leakage –51.5dBm at 500MHz
- Output IP3 +20.8dBm
- Output IP2 +63.6dBm
- Output Noise Floor –156dBc/Hz at $P_{OUT} = 3\text{dBm}$
- SPI Serial Bus Control:
 - o Adjustable Gain: –19dB to 0dB in 1dB Steps
 - o Gain Changes Affect Supply Current from 8mA to 35mA
 - o I/Q Gain/Phase Adjust: Up to –60dBc Sideband Suppression
 - o I/Q Offset Adjust: Up to –65dBm Carrier Leakage

The USA list pricing shown is for budgetary use only. International prices may differ due to local duties, taxes, fees and exchange rates.

About Linear Technology

Linear Technology Corporation, a member of the S&P 500, has been designing, manufacturing and marketing a broad line of high performance analog integrated circuits for major companies worldwide for over three decades. The Company's products provide an essential bridge between our analog world and the digital electronics in communications, networking, industrial, automotive, computer, medical, instrumentation, consumer, and military and aerospace systems. Linear Technology produces power management, data conversion, signal conditioning, RF and interface ICs, μ Module[®] subsystems, and wireless sensor network products. For more information, visit www.linear.com

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Press Contacts:

North America / Worldwide

John Hamburger, Director Marketing
Communications
jhamburger@linear.com
Tel: 408-432-1900 ext 2419

Doug Dickinson, Media Relations Manager
ddickinson@linear.com
Tel: 408-432-1900 ext 2233

UK & Nordic

Alan Timmins
alan@ezwire.com
Tel: +44-1-252-629937